

REMARKS

The present amendment is in response to the Office Action dated June 20, 2003, where the Examiner has rejected claims 1-8. By the present amendment, claims 1 and 2 have been amended, and claims 21-28 have been added. Accordingly, claims 1-8 and 21-28 are pending in the present application. Reconsideration and allowance of pending claims 1-8 and 21-28 in view of the amendments and the following remarks are respectfully requested.

A. Rejection of Claims 1-8 Under 35 USC §102

The Examiner has rejected claims 1-8 under 35 USC §102(e) as being anticipated by Zhao (USPN 6,211,561) ("Zhao '561"). The Examiner has further rejected claims 1, 4 and 6-8 under 35 USC §102(e) as being anticipated by Wang (USPN 6,159,840) ("Wang '840"). Applicant respectfully disagrees; however, in order to expedite the prosecution of the present application, applicant has amended independent claim 1. For the reasons that follow, applicant respectfully submits that claims 1-8 are patentably distinguishable over the cited references. However, applicant reserves the right to provide declarations and/or documents under 37 CFR §1.131 to "swear behind" the effective filing dates of Zhao '561 and Wang '840.

Subject to applicant's reserved right to establish priority of the present invention under 37 CFR §1.131, applicant submits that the present invention, as defined by amended independent claim 1, is directed to a method for fabricating a damascene interconnect structure having one or more air trenches and a plurality of spaced-apart

metal lines comprising, among other things, “fabricating the damascene structure to a via level through a processing step prior to forming contact vias; etching one or more air trenches into the damascene structure so that the air trenches are positioned between selected metal lines; and depositing a sealing layer over the damascene structure having air trenches to seal the air trenches” wherein the step of fabricating the damascene structure, i.e., step (a), further comprises “depositing a first dielectric layer, and depositing a first capping layer over the first dielectric layer.”

In contrast, neither Zhao ‘561 nor Wang ‘840 discloses such a technique. With regard to Zhao ‘561, Zhao ‘561 fails to disclose or suggest depositing a capping layer over the dielectric layer, as specified by claim 1. For example, Zhao ‘561 discloses dielectric layer 18 as a gap filler, and depositing bulk SiO₂ layer 60 over dielectric layer 18. See, for example, Figure 3A and 3B and col. 5, lines 25-29 and 31-36 of Zhao ‘561. Although dielectric layer 18 can include a combination of insulating materials, col. 5, lines 25-31 of Zhao ‘561, Zhao ‘561 points out that dielectric layer 18 and bulk SiO₂ layer 60 are treated as a single dielectric layer 18. See, for example, Figure 3C and col. 5, lines 39-41 of Zhao ‘561. In contrast, as shown in Figure 1 of the present application, capping layer 52 (corresponding to the first capping layer specified in claim 1) is distinct from dielectric layer 40 and performs a distinct function. As noted in the present application, “first capping layer 52 functions to cap or protect the first dielectric layer (if dielectric 40 is an organic low-k material) during etching.” Page 12, lines 11-12 of the present application.

Likewise, Wang '840 fails to disclose or suggest the structure specified by claim 1. More particularly, Wang '840 fails to disclose or suggest depositing a sealing layer as specified by claim 1. While the Examiner describes dielectric layer 214 as a "sealing layer," applicant respectfully submits that dielectric layer 214 is not a sealing layer as specified by claim 1. To clarify, with reference to Figure 6 of the present application, sealing layer 72 is deposited over air gaps 68 to seal the air gaps 68. In this way, sealing layer 72 is distinct from trench dielectric 78 which is later deposited over sealing layer 68, as shown in Figure 12 of the present application. In contrast, Wang '840 simply deposits dielectric layer 214 directly over air gaps 213 as shown in Figure 2C of Wang '840 without a sealing layer. As such, the structure disclosed in Wang '840 has significantly decreased mechanical strength. In sum, Wang '840 discloses a structure that neither discloses nor suggests a sealing layer as specified by claim 1.

Accordingly, applicant respectfully submits that independent claim 1, and its corresponding dependent claims 2-8, are patentably distinguishable over Zhao '561 and Wang '840, and, therefore, claims 1-8 should now be allowed.

B. New Claims 21-28

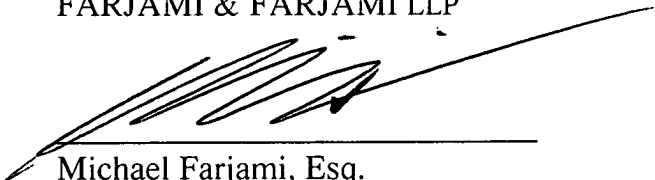
Applicant respectfully submits that claim 21, which further specifies "depositing a polish stop layer over the sealing layer," is patentably distinguishable over the cited references of record. Therefore, claim 21, and its corresponding dependent claims 22-28, should be allowed.

C. Conclusion

For all the foregoing reasons, an early allowance of claims 1-8 and 21-28 pending in the present application is respectfully requested.

Respectfully Submitted;
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